

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION

## Improvements in or relating to Hypodermic Needles

I, CASPER MORLEY EPSTEIN, a citizen of the United States of America, residing at 25, East Washington Street, Chicago, State of Illinois, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has to do with improvements in or relating to hypodermic needles. It relates more particularly to an improved hypodermic needle of the kind which is provided with a stop or guard limiting the penetration of the needle into the tissues of the patient.

Hypodermic needles often break while in the tissues of the patient, the broken-off portion remaining in the patient. Usually the break will occur adjacent the hub of the needle or where it is attached to the body of the syringe, but the needles heretofore known sometimes break at the surface of or within the tissues of the patient and it is very difficult and sometimes impossible to remove the broken-off portions of the needles.

Objects of the present invention are the provision of means for reducing the chances of breakage of hypodermic needles substantially at the surface of or within the tissues of the patient and the provision of a hypodermic needle having such means.

The invention consists in a hypodermic needle having a limit stop or guard secured thereto between the ends thereof, said stop or guard having, at least at several places around the needle, portions extending outwardly and toward the point of the needle from the place of its engagement with the needle to engage the tissues in which the needle is inserted.

The invention also consists in a limit stop or guard for a hypodermic needle, having means for attachment to the needle between the ends of the latter and having portions which, with reference to the needle when the stop or guard is secured thereon, extend outwardly and toward the point of said needle and are

adapted to engage, at least at several points around said needle, the tissues into which said needle is inserted.

The foregoing and other features are hereinafter more particularly described with reference to the accompanying drawings which by way of examples illustrate preferred embodiments of the invention, and in which:—

Figure 1 is a side elevation of one embodiment of the invention and illustrates the improved needle and a portion of the syringe to which it is removably secured;

Fig. 2 is an axial sectional view taken on a line substantially corresponding to line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the stop member before being mounted on the needle; and

Fig. 4 is a fragmentary view of the needle and illustrates an adjustable mounting and securing means for the stop member.

The syringe, part of which is shown in the drawings, comprises a syringe barrel 1 which may be of a conventional type, with a downwardly extending threaded portion 2 having the usual passage there-through to receive a needle. A removable sleeve 3 is threaded on the portion 2 and provided with an internal tapered portion 4 thereby forming a chuck arranged to rigidly support the needle.

The needle is of the removable or interchangeable type and comprises the usual hollow shank 5. This shank is provided with a cone-shaped hub 6 which is rigidly secured to the shank 5 in any suitable manner, preferably by swedging. In order to mount the needle on the body of the syringe the sleeve 3 may be removed and the needle dropped into the sleeve in the position shown in Fig. 2. The sleeve is then threaded onto the portion 2, which clamps the tapered hub 6 securely into the tapered portion 4 of the sleeve 3 and against the end of the extension 2, thereby accurately centering the needle and holding it rigidly in position without undue strain on the needle.

A thrust-limiting stop member 7 is also mounted on the shank 5 intermediate the

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apex of the needle and the hub 6. This stop is secured in any desired position and determines the depth of thrust of the needle. The stop 7 may be made of stainless material and preferably comprises a sheet metal cup-like member having a plurality of downwardly extending spaced portions forming points 8. These points are preferably provided with rounded ends 9 as shown, and three points are preferably provided whereby the needle may be easily visible therebetween. The cup-shaped stop member 7 is also provided with an upwardly extending sleeve portion 10 which fits snugly over the shank 5 and is rigidly secured thereto by swedging or in any other suitable manner. To remove the needle it is only necessary to unscrew the sleeve 3 and lift the needle out. A new one may then be easily inserted. The hole 3a in the sleeve 3 is somewhat larger than the outside diameter of the stop 7 so that the stop will easily pass therethrough.

Fig. 4 illustrates a slightly different method of mounting the stop on the needle 5 whereby the stop may be easily adjusted for different depths of needle thrust. In this construction, which may be applied to the embodiment shown in Fig. 2, the stop member 7a is provided with an upwardly extending sleeve 10a which is of somewhat larger diameter than the shank 5. A split bushing 11 surrounds the shank 5 and is inserted in the sleeve of the stop member as shown, the sleeve being provided with a set screw 12 or other suitable clamping means whereby the bushing 11 may be clamped snugly on the shank 5. By this means the operator may accurately predetermine the depth of thrust of the needle. The split bushing distributes the pressure over a considerable area and prevents the set screw from injuring the needle.

In Fig. 4 the stop member is illustrated as cup-shaped and is not necessarily provided with downwardly extending points such as illustrated in Fig. 2. However, the points may be provided in this construction if desired and are considered preferable.

When the needle is completely inserted, the points 8 or the lower edge of the stop member 7 or 7a, press or presses against the tissue and the structure forms a sort of brace or truss which provides support for the needle at points around and outwardly from the needle, and tends to transfer to the portion of the needle between the stop member and the hub 6 strains which might, in the absence of the member 7 or 7a, cause the needle to break at a point between the point of

securement of the member 7 or 7a and the apex or point of the needle. When the needle breaks off between the hub 6 and the member 7 or 7a, that portion of the needle remaining in the tissue may be easily removed as the broken portion cannot be drawn into the tissue. The spaces between the points 8 permit visibility of the portion of the needle within the cup when the needle is in use and also enable the insertion of a tool under the stop if desired, whereby the broken-off portion may be easily withdrawn.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

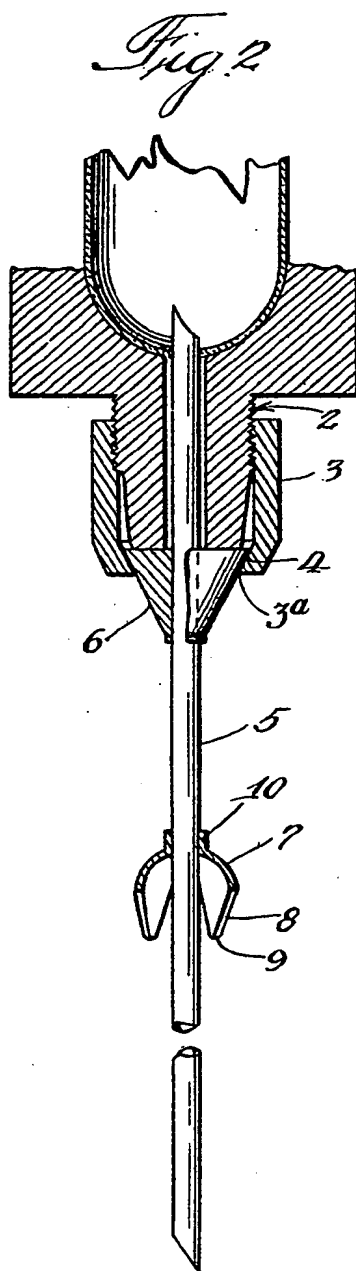
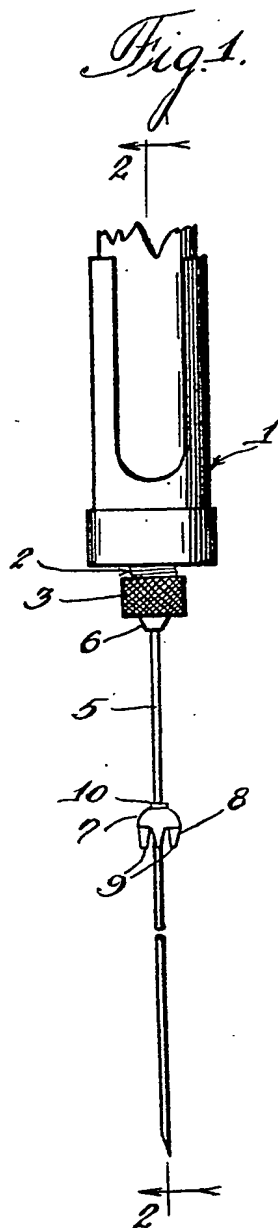
1. A hypodermic needle having a limit stop or guard secured thereto between the ends thereof, said stop or guard having, at least at several places around the needle, portions extending outwardly and toward the point of the needle from the place of its engagement with the needle to engage the tissues in which the needle is inserted.
2. An article according to claim 1, wherein said stop or guard is cup-shaped with its open end toward the point of the needle.
3. An article according to claim 2, wherein the free edge of said cup-shaped stop or guard member is notched.
4. An article according to claim 2 or 3, wherein a sleeve extends rearwardly from the bottom of the cup around the needle and is secured to the latter.
5. An article according to claim 1, 2, 3 or 4, wherein the stop or guard is secured to the needle in a manner permitting adjustment of said stop or guard along the needle.
6. A limit stop or guard for a hypodermic needle, having means for attachment to the needle between the ends of the latter and having portions which, with reference to the needle when the stop or guard is secured thereon, extend outwardly and toward the point of said needle and are adapted to engage, at least at several points around said needle, the tissues into which said needle is inserted.
7. An article according to claim 6, formed as a cup-shaped member adapted to be secured on the needle with its open end toward the point of the needle.
8. An article according to claim 7, wherein the free edge of said cup-shaped member is notched.
9. An article according to claim 7 or 8, wherein a sleeve adapted to receive and to be secured to the needle projects from the bottom of the cup.

10. An article according to claim 9, wherein said sleeve has means, such as a screw and a slotted bushing, for adjustable securement to the needle.
- 5 11. A hypodermic needle substantially as described with reference to Figs. 1 to 3, or to Fig. 4 of the accompanying drawings.
12. A limit stop or guard when used for a hypodermic needle, substantially as 10 described with reference to Fig. 3 or to Fig. 4 of the accompanying drawings.

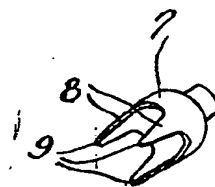
Dated this 13th day of April, 1937.  
For the Applicant,  
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10, New Court, Lincoln's Inn,  
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[This Drawing is a reproduction of the Original on a reduced scale.]



*Fig. 3.*



*Fig. 4.*

